



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,279	03/13/2001	Robert M. Barnhart	SAIC0039	1264
75131 7590 06/04/2009 KING & SPALDING LLP (SAIC CUSTOMER NUMBER) ATTN: DAWN-MARIE BEY 1700 PENNSYLVANIA AVE, NW SUITE 200 WASHINGTON, DC 20006				
			EXAMINER JARRETT, SCOTT L	
			ART UNIT 3624	PAPER NUMBER
			MAIL DATE 06/04/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

09/805,279

Applicant(s)

BARNHART, ROBERT M.

Examiner

SCOTT L. JARRETT

Art Unit

3624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date: _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This **Final** office action is in response to Applicant's request to reopen prosecution under 37 C.F.R. 41.39(b)(1) in order to address the new grounds of rejection under 35 U.S.C. 101 raised in the Examiner's Answer to Appeal Brief mailed March 6, 2009. Applicant's response amended claims 29-33. Currently claims 29-33 are pending.

Response to Amendment

2. The 35 U.S.C. 101 rejection of claims 29-33 in the previous office action is withdrawn in response to Applicant's amendment to the claims.

Response to Arguments

3. Applicant's arguments filed May 5, 2009 have been fully considered but they are not persuasive. Specifically Applicant's argue that: the VSN cannot be assigned until after a vote is delivered (Bullets 1-2, Page 9); Shrader fails to teach or suggest (1) a method for assisting a user in verifying a cast ballot (Bullet 1, Page 10); (2) forming a digital signature of Bcast using a private key of the server DS(Bcast, s) (Bullet 1, Page 11); (3) associating the Bcast and DS(Bcast,s) with a vote serial number (Bullet 1, Page 12); (4) forming a confirmation token, comprising DS(Bcast,s) and VSN (Bullet 1, Page 13); (5) receiving or making a confirmation token available to a user (Bullet 1, Page 14); or (6) the comparison and verification steps (Bullet 2, Page 14); Examiner mischaracterizes the phrase cast ballot and vote serial number (Bullet 1, Page 16); and

Cranor fails to teach or suggest determining whether a confirmation token has been modified (Bullet 1, Page 17)

In response to Applicant's arguments that the vote serial number cannot be assigned until after a vote is delivered, the examiner respectfully disagrees. Neither the original disclosure nor the amended disclosure clearly describe precisely when the vote serial number is assigned only that the number is indicative of a vote delivered. Accordingly neither the specification, nor the claimed invention, provide any specificity or clarity as to how or when a vote serial number is assigned/associated to/with a ballot (i.e. the specification provides no clear guidance as to how to interpret the claim "associating the Bcast and DS(Bcast,s) with a vote serial number VSN").

The originally filed disclosure recites the vote serial number in only the following Paragraphs: 0018, 0023, 0054, 0057, 0070 and 0072 (some of which are reproduced below, emphasis added) of which Paragraphs 0018 and 0023 provide the most relevant details as to when and how a vote serial number is associated/assigned to a ballot (namely prior to the ballot being cast).

[0018] In accordance with one aspect of the invention, there is provided *a method of securely voting over a network*, which can be a local area network, or a wide area network such as the global computer network known as the Internet. The method involves **delivering an electronic ballot from a server with a vote serial number on the ballot**, to an individual at a terminal over a connection secured using both the server's and the voter's private keys. **Thereafter, the ballot is filled in with the voter's**

choices, which are digitally signed using the voter's private key. The voter's ballot choices, bearing the voter's electronic signature, and **the vote serial number is then delivered to the server**. A data element is then created from the individual's digital signature of the ballot choices, the server's digital signature of the voter's ballot choices (created using the server's private key) and the vote serial number to allow recording of the subset of the ballot in a data store at the server, and retaining the ballot information as a vote. This data element is then digitally signed using the server's private key to ensure its integrity and authenticity.

[0023] In an alternative aspect, there is described a system for conducting *secure voting over a network*, for example, the global computer network known as the Internet, or on a local area network. The system includes a server having a data store associated therewith. The server is configured for connection to the network for communicating with terminals connected to the network. The server is further configured for **delivering an electronic ballot having the vote serial number on the ballot**, to an individual at a terminal connected to the network, and **the ballot being configured for being filled in by the individual**, and for having a subset thereof delivered to the server with the individual's electronic signature, and the vote serial number thereon.

[0054] The individual's signature of the ballot is then delivered to the server 43 side where it is combined with three other elements at block 59. Specifically, the server's signature 53 is combined with the individual's signature 57 along with **a vote serial number (VSN) which is, for example, like a ballot serial number and can be an arbitrary number that goes from one to infinity. The vote serial number can be**

generated per election, and has no relationship to the voter, and is just an incidental sequence number that indicates a vote delivered in the election. Those three elements are then digitally signed by the server yielding DS(C,s), and the four combine into an aggregation of core components which is a ballot confirmation token. This allows confirmation that a particular ballot has been retained in the system and no tampering has occurred. That token is then transmitted back to the individual as a confirmation token 61. The confirmation token 61 can then be encrypted with the individual's public

[0070] It will be appreciated that within the collection 109 of function boxes, separate functionality and information is provided, for example, from the collection of election ballots 113, **vote serial numbers** 119, and certificates 117, characterized preferably as X.509 certificates. In the Figure, block 115 is typically the application database server 23 shown in FIG. 1 and serves to compile the election voter table, election database and optionally, a voter demographics database, all of which will be described hereafter with reference to the lower half of FIG. 3.

Therefore the examiner is interpreting the claim to encompass associating any unique identifier with a ballot either before or after the voter (user) casts his/her vote ("vote serial number", as defined by the specification,,: "Note that the VSN... is ***just an incidental sequence number*** that indicates a vote was delivered in the election" (emphasis added, Paragraph 0054).

Additionally it is noted that a pre-cast ballot (vote) having an associated vote serial number (e.g. ballot number) retains (remains associated with) the unique identifier even after the ballot has been cast (i.e. once the vote serial number has been assigned

to the vote/ballot it remains associated with the ballot before, during and after the user votes using the ballot).

Further it is noted that it is old and very well known in database systems to assign a unique identified (key, primary key, candidate key, unique key), either manually or automatically by the database management system, to all records in a database in fact databases would be unusable without a unique identified associated and assigned to each record as it is stored into the database.

In response to Applicant's argument that the examiner mischaracterizes the phrases vote serial number and cast ballot and further that the prior art of record fails to teach or suggest associating a vote serial number with B_{cast}, the examiner respectfully disagrees.

As an initial matter the examiner has given the terms cast ballot, vote serial number and user the usual and customary definitions (cast ballot: voted ballot, committed ballot, vote, completed ballot, submitted ballot, vote; vote serial number: any unique vote identifier). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Specifically, in response to the Applicant's argument that the OA mischaracterized the phrase "cast ballot" the examiner notes that the prior art of record clearly teaches voters casting (submitting) their ballots wherein the ballots (vote) contains their choices and further wherein those cast ballots are commonly protected by

some a cryptographic function such as a digital signature, PKD encryption or the like (Shrader et al.: Paragraphs 0048-0053).

Shrader et al. teach a system and method for securely voting over a network wherein voters complete and submit (cast) their ballots (Paragraphs 0035, 0041, 0042, 0059-0060; Figure 4, Elements 44-45; Figure 7, Elements 66-67).

“Voting entity casts its votes and encrypts the votes and the electronic ballot with the public key of the voting tabulator before sending the encrypted voting information to the voting tabulator.”, emphasis added, Paragraph 0062

Cranor et al. teaches a system and method for securely voting over a network wherein users (voters) cast and sign (encrypting, sealing) their cast ballot (encrypted ballot; Paragraph 5, Page 7; Paragraph 3, Page 8; Figure 1, b - blinded ballot digest).

Pollster The pollster acts as a voter's agent, presenting human readable ballots to a voter, *collecting the voter's responses to ballot questions, performing cryptographic functions* on the voter's behalf, obtaining necessary validations and *receipts, and delivering ballots to the ballot box.* (emphasis added, Paragraph 5, Page 7)

Tallier The tallier is responsible for *collecting the voted ballots* and tallying the results of the election or survey. *Voters first submit encrypted ballots, signed by the validator to the tallier.* The tallier checks the authenticity of the validation and verifies that the *encrypted ballot is unique* among the encrypted ballots received thus far. If the ballot is valid and unique, the tallier *issues a signed receipt to the voter.* The voter then submits the ballot decryption key. The tallier uses the key to

decrypt the ballot. After the election, the tallier publishes a list of encrypted ballots, decryption keys, and decrypted ballots, allowing for independent verification of election results. (emphasis added, Paragraph 3, Page 8)

In response to the Applicant's argument that the OA mischaracterized the phrase "vote serial number", as defined by the specification "Note that the VSN... is *just an incidental sequence number* that indicates a vote was delivered in the election" (emphasis added, Paragraph 0054), the examiner respectfully disagrees.

Shrader et al. teach a system and method for securely voting over a network wherein ballots, both cast and pre-cast, are assigned a vote serial number (unique identifier; Figure 6, Element 58; ballot number, Paragraph 0063;

"creates a electronic ballot consisting of the unique election identification and *ballot serial number*", emphasis added, Paragraph 0061

Cranor et al., teaches a system and method for voting securely over a network comprising associating at least two unique identifiers to ballots cast by voters wherein the unique identifiers (vote serial numbers) are generated and associated with the cast ballot only *after* the voters casts their ballot containing their choices (receipt number: Paragraphs 3-4, Page 8; Figure 1; index number for uniquely identifying, accessing and storing cast ballots in a database, Paragraph 4, Page 8)

Our tallier computes a 16-byte digest of *each encrypted ballot received* and uses it *to index the encrypted ballots and receipts*. A hash table could be added for greater efficiency in *looking up encrypted ballots*. This modification is probably

necessary to accommodate large-scale elections. (emphasis added, Paragraph 4, Page 8)

Nothing in the claimed method steps specifically recites when or how a vote serial number is generated or subsequently associated with a Ballot. Further nothing in the invention as claimed precludes the assignment of a vote serial number to a ballot before, during or after the ballot has been cast, delivered (e.g. sent to a voter/user) or otherwise acted upon. Further Applicant's own disclosure teaches that the vote serial number is just an incidental sequence number (Paragraph 0054).

Examiner has interpreted the claim to read that a Ballot has an vote serial number associated with it and it is that vote serial number, regardless of when or how it was associated with the Ballot, that is used in the subsequent method steps for forming/making and comparing the various tokens/keys.

Shrader et al. teach associating a Vote Serial Number to a cast Ballot (one that has been delivered to a user; vote serial number, unique number/unique identifier, etc.; validating ballot request; Paragraph 0061; Figures 5-6, Elements 57, 58; validating/authenticating cast ballot; Paragraph 0063; Figure 8, Element 71).

Cranor et al. teach associating the cast ballot with a vote serial number (Paragraphs 3-7, Page 7; receipt number/#; Figure 1, Pages 3-4; Page 8; db index, Paragraph 1, Page 11).

In response to Applicant's argument that the prior art of record fails to teach or suggest assisting a user verify a ballot stored in a server the examiner respectfully

disagrees. The recitation "assisting a user verify a ballot stored in a server" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Cranor et al. (individual verifiability; Paragraphs 1-2, Page 12).

Further assisting users in verifying cast ballots (i.e. their votes) commonly referred to as Individual Verifiability as well as the use of Vote Serial Numbers to uniquely identify the cast ballot (vote) are old and well known evidenced by at least the following references:

- Cranor et al., Design and Implementation of a Practical Security Conscious Electronic Polling System (1996), P 1-2, Pg 12, "receipt #", Fig 1, P3-4, Page 8, db index, P1, Pg 11
- VoteHere.net Web Pages (2000) P5, Pg 17, P3.6, Pg 9, Pg 13
- Reardon US 6,968,999: C5 L55-68, Fig 2 E 23, 24; C3 L23-38, C5 L63-68, Fig 2 E23,24
- Chung US 7,036,730: C7 L8-23, C8 L37-55, "voting session identifier", C2 L60-68, C3, L8-30, C5 L8-15, 56-58; C10 L35-45, Fig 4c

In response to the Applicant's argument that the OA mischaracterized the phrase "user" the examiner respectfully disagrees.

Shrader et al. teach a system and method for secure network voting wherein at least one of the system/method participants/users is a voter who casts a ballot (Paragraphs 0035, 0041, 0042, 0059-0060; Figure 4, Elements 44-45; Figure 7, Elements 66-67).

Cranor et al. teach a system and method for securely voting over a network wherein at least one of the system/method participants/users is a voter who casts a ballot (Paragraph 5, Page 7; Paragraph 3, Page 8; Figure 1).

Additionally it is noted that the invention as claimed merely recites "making a confirmation token available to *a user*" wherein the claim does not positively recite that the "a user" performs any of the method steps as claimed nor does the invention as claimed positively recite which user (the "a user" recited in the preamble or another user of the system) the token is made available to nor does the invention as claimed positively recite what entity (the "a user" in the preamble or some other entity/participant) actually retrieves/receives the now available confirmation token nor does the invention as claimed positively recite what entity performs the comparison to determine that the cast ballot is verified (the "a user" of the preamble or another method participant/entity).

In response to Applicant's argument that the prior art of record fails to teach or suggest forming a digital signature of B_{cast} using a private key of the server the examiner respectfully disagrees.

Shrader et al. ("The voting tabulator *signs, encrypts and sends the encrypted electronic ballot* to the voting mediator 72 in a message that is encrypted with the voting mediator's public key and signed with the *validator's private key*; Paragraph 0063; Figures 7-8, Element 72).

In response to Applicant's argument that the prior art of record fails to teach or suggest forming a confirmation token comprising $DS(B_{\text{cast}}, S)$ and the vote serial number the examiner respectfully disagrees.

Shrader et al. (verification message(s) exchanged between tabulator to mediator; Paragraphs 0061, 0063; Figures 7-8).

Cranor et al. (Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1).

In response to Applicant's argument that the prior art of record fails to teach or suggest making the confirmation token available to a user the examiner respectfully disagrees.

Initially it is noted that the whether or not the confirmation token is made available to a user or not merely recites non-functional descriptive material wherein the method steps are performed in the same manner and result in the same result

regardless of whether or not the confirmation token is made available to a user especially since the claims fail to state what, if anything, the user does or does not do upon the confirmation token being made available. Neither to the claims specifically recite what qualifies making the confirmation token available to a user (e.g. the token is in a human-readable format, posted on a web page, sent via an email, can be requested or viewed by the user, nearly anything within the computer systems of Shrader et al. and Cranor et al. qualify under the broad term of making available).

Shrader et al. (verification message exchanged between tabulator to mediator; Paragraphs 0061, 0063; Figures 7-8).

Cranor et al. (Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1).

In response to Applicant's argument that the prior art of record fails to teach or suggest that determining the comparison shows equivalence determining that B_{cast} is verified the examiner respectfully disagrees.

Shrader et al. (Paragraphs 0061, 0063; Figures 7-8).

Cranor et al. (Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 29-30 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Shrader et al., U.S. Patent Publication No. 2002/0077887.

Regarding Claims 29 and 33 Shrader et al. teach a method and system for assisting a user in verifying a cast ballot recorded (saved, stored, executed, etc.) in a system (server) comprising (Abstract; Paragraphs 0050-0053; 0060-0063; Figures 4-8):

- forming (generating, creating, signing, encrypting, etc.) a digital signature of a cast ballot using the private key of a system (server; "The voting tabulator *signs, encrypts and sends the encrypted electronic ballot* to the voting mediator 72 in a message that is encrypted with the voting mediator's public key and signed with the *validator's private key*; Paragraph 0063; Figures 7-8, Element 72);

- associating (storing, linking, relating, etc.) the cast ballot, the voter's digital signature of the ballot with a ballot number (vote serial number, unique number/unique identifier, etc.; validating ballot request; Paragraph 0061; Figures 5-6, Elements 57, 58; validating/authenticating cast ballot; Paragraph 0063; Figure 8, Element 71);

- forming a message (confirmation, string, receipt, acknowledgement, token, etc.) comprising a system's digital signature of the ballot and the ballot number (verification message(s) exchanged between tabulator to mediator; Paragraphs 0061, 0063; Figures 7-8);

- making the message available (verification message exchanged between tabulator to mediator; Paragraphs 0061, 0063; Figures 7-8);

- receiving the message (verification message(s) exchanged between tabulator to mediator; Paragraphs 0061, 0063; Figures 7-8, Elements 72-74);

- extracting (decrypting, stripping, de-signing, deciphering, etc.) the ballot number and the system's digital signature from the message (verification message(s) exchanged between tabulator to mediator; Paragraph 0063; Figures 7-8, Elements 73-75);

- for vote serial number comparing the system's digital signature of the ballot received to the system's digital signature of the ballot (Paragraphs 0061-0063; Figures 7-8); and

- determining the comparison shows equivalency (match, consistency, equality, etc.) determining that cast ballot (message, token, etc.) is verified (valid, authentic, genuine, unaltered, secure, etc.; Paragraphs 0061, 0063; Figures 7-8).

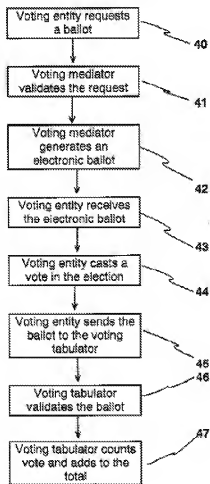


FIG. 4

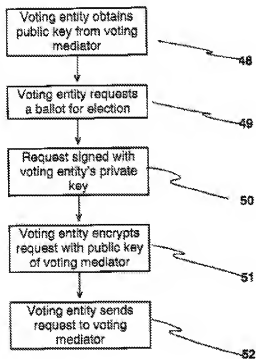
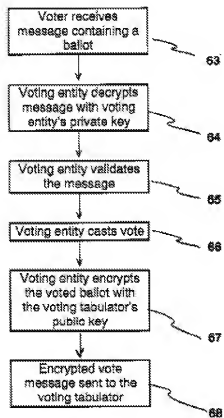
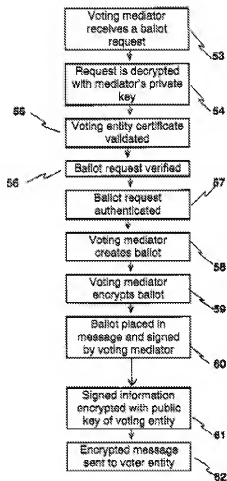
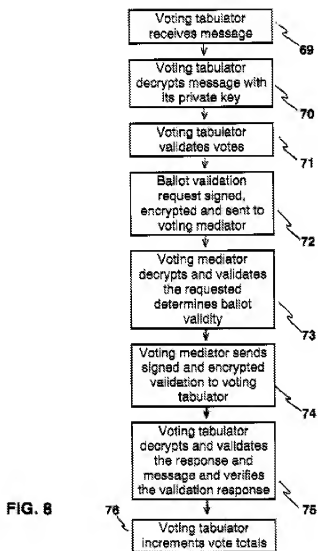


FIG. 5





Regarding Claim 30 Shrader et al. teach a method and system for assisting a user in verifying a ballot recorded in a system wherein the message (confirmation token, received token) further comprises the system's digital signature of the ballot and ballot number (aggregation; Paragraphs 0060-0062; Figure 2, Certificate No.); and wherein the method further comprises the steps of:

- extracting a digital signature of the ballot and ballot number (aggregation) from the message (received token; Paragraphs 0060, 0061, 0063; Figures 6-8); and
- the cast ballot is verified only upon the additional condition that the server's received digital signature of the aggregation is equivalent to the server's digital signature of the aggregation (Paragraphs 0061, 0063; Figures 6-8; Elements 67-75).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cranor et al., Design and Implementation of a Practical Security-Conscious Electronic Polling System (1996) in view of Shrader et al., U.S. Patent Publication No. 2002/0077887.

Regarding Claim 31 Cranor et al. teach a method and system for assisting a user in verifying (validating, authenticating, certifying, etc.) a cast ballot (vote) recorded (saved, stored, etc.) in a server (system) the method/system comprising (Abstract; Figures 1,3):

- receiving, in a system (server, computer, terminal, device, etc.), at least one set of a cast ballot and a voter's digital signature of the ballot (Paragraph 2, Page 5);
- forming (generating, creating, signing, encrypting, etc.) a digital signature of the ballot using the private key of a system (Paragraph 2, Page 5);
- associating (storing, linking, relating, etc.) the cast ballot, voter's digital signature of the ballot and the voter's identification number (Paragraphs 3-4, Page 7);

- forming a message (confirmation token, string, receipt, acknowledgement, etc.) comprising system's digital signature of the cast ballot, the voter's digital signature of the cast ballot, and the system's digital signature of the aggregation of the cast ballot, the voter's digital signature of the ballot and the system's digital signature of the ballot ("validator", "tallier", "validation certificate", "receipt"; Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1);

- making the message (token, string, etc.) available to a user (entity, voter, system, subsystem, third party, etc.; Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1);

- receiving the messages (confirmation, token, verification, acknowledgement, etc.; Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1);

- extracting (decrypting, stripping, etc.) *at least one of the following* from the message Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1):

- voter's digital signature of the ballot; **or**
- system's digital signature of the ballot; **or**
- system's digital signature of the voter's digital signature of the ballot, the system's digital signature of the ballot, ballot number (aggregation);
- for extracted ballot number and the corresponding ballot number comparing *at least one of the following* (Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1):

- voter's digital signature of the ballot extracted from the message and voter's digital signature of the ballot; **or**
- system's digital signature of the ballot extracted from the message and system's digital signature of the ballot, **or**
- system's digital signature of the ballot, digital signature of the voter's digital signature of the ballot, the system's digital signature of the ballot, ballot number (aggregation) extracted from the message and system's digital signature of the ballot, digital signature of the voter's digital signature of the ballot, the system's digital signature of the ballot, ballot number (aggregation); and
- determining the comparison shows equivalency (match, consistency, equality, etc.) determining that the cast ballot is verified (valid, authentic, genuine, unaltered, accepted, counted, etc.; Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8; Figure 1).

Cranor et al. further teaches individual verifiability (Paragraphs 1-2, Page 12) as well as a unique vote/ballot identifier (receipt number/#; Figure 1, Pages 3-4; Page 8; db index, Paragraph 1, Page 11).

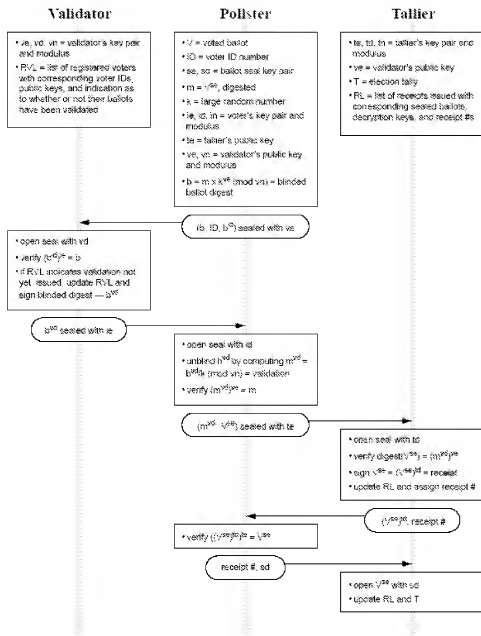


Figure 1: Blind Signature Protocol Overview

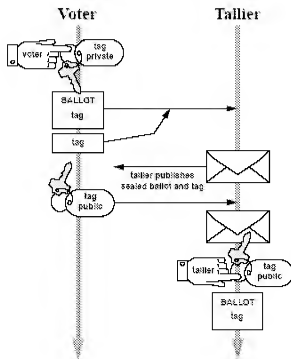


Figure 3: Phase 2 of the Two Agency Protocol

Cranor et al. teaches a system and method for voting securely over a network comprising associating at least two unique identifiers with ballots cast by voters wherein the unique identifiers (vote serial numbers) are generated and associated with the cast ballot only *after* the voters casts their ballot containing their choices (receipt number: Paragraphs 3-4, Page 8; Figure 1; index number for uniquely identifying, accessing and storing cast ballots in a database, Paragraph 4, Page 8)

Our tallier computes a 16-byte digest of *each encrypted ballot received* and uses it to *index the encrypted ballots and receipts*. A hash table could be added for greater efficiency in *looking up encrypted ballots*. This modification is probably necessary to accommodate large-scale elections. (emphasis added, Paragraph 4, Page 8)

While the use of unique identifiers for (paper and/or electronic) ballots is a common practice Cranor et al. does not expressly teach that the cast ballot contains a vote serial number as claimed.

Shrader et al. teach that ballots comprise a vote serial number (unique ballot ID, certificate no.) in an analogous art of secure electronic voting/balloting over a network for the purposes of ensuring voters only cast their ballot once (Paragraph 0061; Figures 2, 5-6, Elements 57, 58; validating/authenticating cast ballot; Paragraph 0063; Figure 8, Element 71).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for verifying a cast ballot recorded on a system (server) as taught by Cranor et al. would have benefited from including in the ballot a unique ballot identifier (vote serial number) in view of the teachings of Shrader et al.; the resultant system/method providing an additional mechanism for ensuring that valid voters only vote once (Shrader et al.: Paragraph 0063).

Regarding Claim 32 Cranor et al. teach a method and system for verifying a cast ballot recorded in a system further comprising determining the comparison shows equivalence between the system's digital signature of the ballot, digital signature of the voter's digital signature of the ballot, the system's digital signature of the ballot,

extracted from the message and system's digital signature of the ballot, digital signature of the voter's digital signature of the ballot and the system's digital signature of the ballot (aggregation) determining that the message (token) has not been modified (altered, disturbed, edited, etc.) since its formation (Paragraph 2, Page 5; Last Paragraph, Page 7; Paragraphs 1-4, Page 8).

Cranor et al. does not expressly teach that ballots further comprise vote serial numbers as claimed.

Shrader et al. teach that ballots comprise a vote serial number (unique ballot ID) in an analogous art of secure electronic voting/balloting for the purposes of ensuring voters only cast their ballot once (Paragraph 0061; Figures 5-6, Elements 57, 58; validating/authenticating cast ballot; Paragraph 0063; Figure 8, Element 71).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for verifying a cast ballot recorded on a system (server) as taught by Cranor et al. would have benefited from including in the ballot a unique ballot identifier (vote serial number) in view of the teachings of Shrader et al.; the resultant system/method providing an additional mechanism for ensuring that valid voters only cast their ballot once (Shrader et al.: Paragraph 0063).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT L. JARRETT whose telephone number is (571)272-7033. The examiner can normally be reached on Monday-Friday, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley Bayat can be reached on (571) 272-6704. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Scott L Jarrett/
Primary Examiner, Art Unit 3624